OROVILLE FACILITIES RELICENSING
FERC PROJECT NO. 2100

SP-T8 Project Effects on
Non-Native Wildlife
Draft Final Report

Table 1. List of Non-Native Vertebrate Wildlife Species Potentially Found within the Project Area

Common Name	Scientific Name	Status
Bullfrog	*Rana catesbeiana*	DFG Harvest
House sparrow	*Passer domesticus*	
Bobwhite quail	*Colinus virginianus*	DFG Harvest
Ring-necked pheasant	*Phasianus colchicus*	DFG Harvest
Wild turkey	*Meleagris gallopavo*	DFG Harvest
Rock dove	*Columba livia*	
European starling	*Sturnus vulgaris*	
Virginia opossum	*Didelphis virginiana*	DFG Harvest
Black rat	*Rattus rattus*	
Norway rat	*Rattus norvegicus*	
House mouse	*Mus musculus*	
Muskrat	*Ondatra zibethicus*	DFG Harvest
Red fox	*Vulpes vulpes*	
Feral pig	*Sus scrofa*	DFG Harvest

The three principal land management agencies within the project area are the California Department of Fish and Game (DFG), the California Department of Parks and Recreation (DPR), and the California Department of Water Resources (DWR).

Each of these agencies has differing management goals and policies related to non-native species which are largely dictated by their varied missions.

DWR

DWR is primarily concerned with those non-native species which damage project facilities, disrupt operations, or occur in densities which represent a public health hazard.

Past control activities have focused on rodent control using vegetative management and rodenticides as part of facility maintenance

DFG

- Part of the DFG mission is to manage wildlife and habitats for use and enjoyment by the public.
- This public use and enjoyment is not restricted to native species. Bullfrog, Virginia opossum, ring-necked pheasant, wild turkey, muskrat, bobwhite quail, feral pig, and red fox are DFG harvest species.
- Another part of the CDFG mission is to maintain native fish, wildlife, plant species and natural communities for their intrinsic and ecological value. So, an additional responsibility of the DFG is to insure that non-native species populations are controlled at levels which do not adversely impact native species or habitats

DPR

A part of the DPR's mission is to preserve the State's extraordinary biological diversity.

To maintain biological diversity, management policy is directed toward preservation of native species and plant communities and exclusion or eradication of non-native species.

Study Purpose

The primary purpose of Study Plan T-8 is to provide information to land management agencies on potential management practices for population control of non-native species as appropriate to meet each agencies land and wildlife management goals.

Study Methods

Task 1-Literature Review

After review of existing literature, a brief description of each species' biology, life history, and population control methods were compiled. These descriptions included information on the non-native species interactions with native species, including humans.

Study Methods

Task 2-Field Survey

During the course of terrestrial resource relicensing studies all observations/detections of the 14 non-native species were recorded relative to habitat type and project features.

Study Methods

Task 3-Identification of Potential Control Methods

- õ Identification of potential management practices for population control of non-native species were primarily developed through review of published literature.
- õ These management practices are provided as a reference to land management agencies rather than as recommendations.
- õ It appears likely that each land management agency may select differing control mechanisms, as appropriate, on a site specific basis.

Results

- Three of the 14 non-native species were not detected during field survey
  - Red fox
  - Feral pig
  - Bobwhite quail

- This evaluation has identified localized situations where the populations of two non-native species may adversely impact specific agency wildlife management goals.
  - Bullfrogs within the Oroville Wildlife Area
  - Wild turkey at Loafer Creek Recreation Area

Species Accounts

Bullfrog

- Habitat
  - 365 acres of high suitability habitat present within the project area.
  - Algae, invertebrates, and a permanent source of slow-moving water are essential habitat elements for the bullfrog
- Species Interactions
  - Adult bullfrogs are opportunistic feeders, taking both aquatic and terrestrial prey, including invertebrates, fish, native frogs and tadpoles, snakes, birds, salamanders, toads, turtles, and mice
  - Bullfrog populations have been linked with the decline of native species associated with emergent wetland habitats
- Control Methods
  - Sport harvest
  - Grazing control
  - Spring/summer water management

House Sparrow

- Habitat
  - The ideal habitat type is urban, of which 659 acres exist within the study area.
  - Buildings are the only essential habitat element.
  - Seeds and grains are secondarily essential habitat elements
- Species Interactions
  - House sparrows are aggressive nesters and frequently displace native avian species including swallows, western bluebirds, house wrens, and house finches by evicting nesting adults or destroying eggs and nestlings
- Control Methods
  - Modified structures to limit their suitability as house sparrow nest sites by physically blocking cavities, niches, or open eves
  - Monofilament line barriers
  - Garbage control

Bobwhite Quail

- Habitat
  - This species appears to be currently absent from project area
  - Habitat requirements similar California Quail
- Species Interactions
  - Probably compete directly with native quail
- Control Methods
  - Sport harvest
  - Restrict bobwhite use in dog trials

Ring-Necked Pheasant

- Habitat
  - The ideal habitat type is tall annual grassland with dense cover, of which 796 acres exist in the project area
  - Essential habitat elements are grains and an herbaceous layer
  - Secondarily essential habitat elements for this species include seeds, insects, and a shrub or grassland edge with agriculture
- Species Interactions
  - Pheasants documented to practice parasitic egg-laying in the nests of other ground nesting native species
- Control Methods
  - Cover reduction
  - Sport harvest
  - Restriction on use in dog trials
  - Trapping and relocation

Wild Turkey

- Habitat
  - Ideal habitat types for this species are:
    - Tall annual grasslands with dense cover (796 acres)
    - Several seral stages in blue oak woodland (4,616 acres)
    - Montane hardwood (5,209 acres)
    - Montane hardwood-conifer (9,754 acres)
    - Montane riparian (46 acres).
    - Seeds, acorns, and an herbaceous layer are secondarily essential habitat elements
- Species Interactions
  - Competition for acorns
  - Occasional predation on amphibians, reptiles, and rare plants
- Control Methods
  - Sport harvest
  - Trap/relocation

Rock Dove

- Habitat
  - The ideal habitat type for this species is urban, of which 659 acres exist within the study area.
  - Buildings, an herbaceous layer, and water are essential habitat elements for rock doves.
- Species Interactions
  - May compete with native species for food resources including waste grains, seeds, and human food scraps
  - Disease transmission to humans and other animals
- Control Methods
  - Rendering perch sites inaccessible or unsuitable
  - Physical modification of structures
  - Sport hunting
  - Trap/relocation
  - Garbage control

European Starling

- Habitat
  - The ideal habitat types for this species are open seral stages of:
    - blue oak woodland (1,732 acres)
    - blue oak-foothill pine (570 acres)
    - urban habitat (659 acres)
  - Invertebrates and terrestrial insects are essential habitat elements
- Species Interactions
  - Successfully displace secondary cavity nesters including
    - wrens, nuthatches, swallows, titmouse, bluebirds, kestrels, acorn woodpeckers and wood ducks
- Control Methods
  - Mirrors, flashing lights, phenethyl alcohol, eyespots, magnetic fields, and avian-predator effigies ineffective
  - Garbage control
  - Nest destruction

Virginia Opossum

- Habitat
  - The ideal habitat type for the Virginia opossum is some seral stages of valley foothill riparian (159 acres)
  - invertebrates and carrion are secondarily essential habitat elements
- Species Interactions
  - excellent climber and may pose a threat to native bird eggs
  - Competition for burrows
- Control Methods
  - Sport harvest
  - Garbage control

Black Rat

- Habitat
  - urban habitat (659 acres)
  - Prefers campgrounds and dumps
  - Omnivorous, feeding on fruits, grains, fish, invertebrates, small terrestrial vertebrates, and human garbage
- Species Interaction
  - Closest competitors are non-native Norway rat and muskrat
  - Black rats carry a variety of diseases that can affect humans, including bubonic plague, rabies, typhus, tularemia, and trichinosis
- Control Methods
  - Landscape modification
  - Garbage control
  - Rodenticides

Norway Rat

- Habitat
  - An ideal habitat type for this species is urban (659 acres)
  - Rice agriculture also preferred occurs along the projects western edge
  - Water, buildings, and dumps are secondarily essential elements
- Species Interactions
  - diet consisting of grains, fruits, insects, birds, mammals, garbage, sewage, and meat scraps
  - preys upon the eggs of native bird
  - carries a variety of diseases including salmonellosis, tularemia, leptospiral jaundice, Haverhill fever, and typhus fever
- Control Methods
  - Garbage and sewage control
  - Landscape modifications
  - anticoagulant rodenticides
  - capsaicin is an effective repellant

House Mouse

- Habitat
  - Ideal habitat types annual grassland (803 acres) and urban (659 acres)
  - Water, buildings, and dumps are secondarily essential habitat elements
  - Diet consists of grains, fruits, seeds, vegetables, fleshy roots, meat, arthropods, glue, paste, soap, and other household items
- Species Interactions
  - Native harvest mice and microtus (voles) dominate this introduced species, and the introduced Norway and black rats are common competitors
  - Can carry and transmit diseases, such as salmonellosis
- Control Methods
  - Garbage control
  - Anticoagulant rodenticides
  - Snap trapping
  - Cinnamamide as a repellant
  - Installation of raptor perches

Muskrat

- Habitat
  - Emergent wetland (293 acres)
  - Montane riparian (529 acres)
  - Valley foothill riparian (120 acres)
  - Emergent aquatic vegetation, an herbaceous layer, and water are essential habitat elements
- Species Interactions
  - Diet consists of aquatic plants, favoring roots and stems, as well as invertebrates and fish
  - Muskrats compete with the introduced Norway rat
- Control Methods
  - Trapping and euthanasia
  - Water level control
  - Bank exclusions

Red Fox

- Habitat
  - No ideal habitat type exists within the project boundary
  - Red fox has no essential habitat elements
- Species Interactions
  - Feeds primarily on small and medium-sized mammals, fruits, berries, and grasses
  - Increasingly important predator of nesting waterfowl, shorebirds, and upland game birds
  - Carry and potentially transmit diseases such as rabies, distemper, sarcoptic mange, and parvovirus to pets
- Control Methods
  - Garbage control
  - Trapping/euthanasia
  - Sport harvest
  - Coyotes as a biological control
  - Neutering

Feral Pig

- Habitat
  - Ideal habitat types are some seral stages of
    - blue oak woodland (864 acres)
    - blue oak-foothill pine (3,034 acres)
    - montane hardwood (1,727 acres)
    - mixed chaparral (531 acres)
  - Feral pigs also consume wild oats, grasses, forbs, berries, roots, bulbs, insects, crayfish, frogs, snakes, salamanders, mice, ground-nesting bird eggs, and carrion
- Species Interactions
  - Ground nesting bird nest destruction
  - Rooting related plant community changes
  - Direct competition for acorns
- Control Methods
  - Sport harvest
  - Trapping/relocation
  - anticoagulant warfarin

Questions